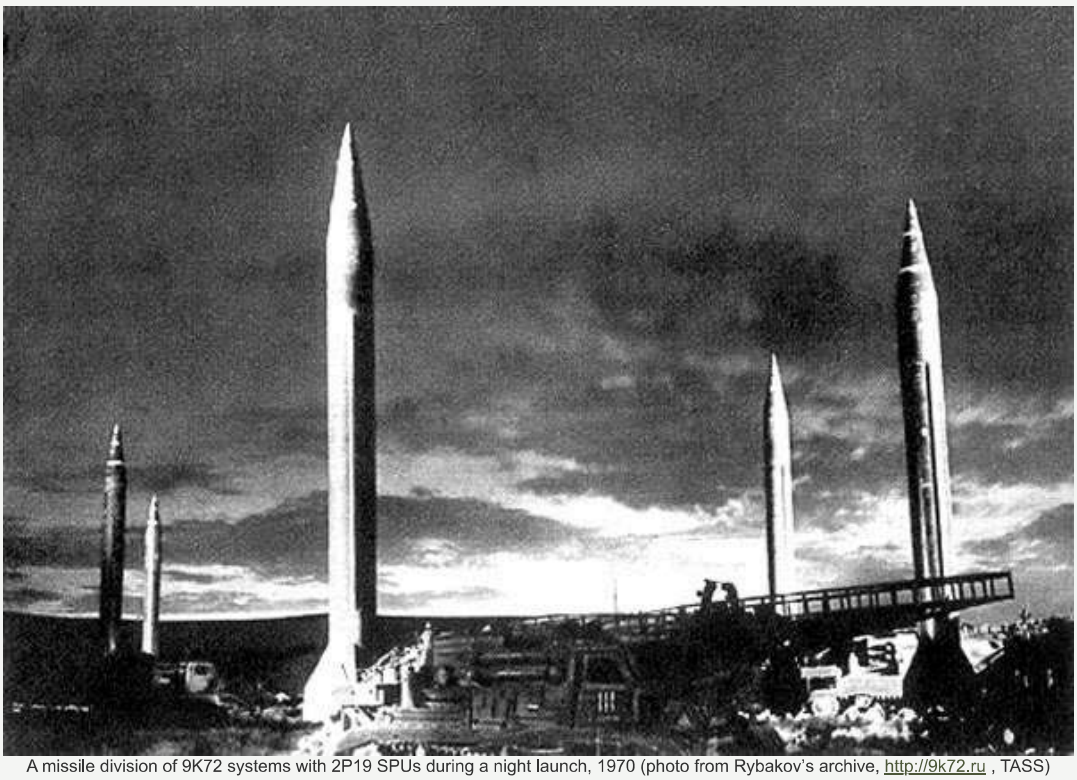
9K72 / R-17 - SS-1C/D/E SCUD-B/C/D - complex infrastructure, projections

DATA AS OF 2012 (standard replenishment)
9K72 / R-17 - SS-1C/D/E SCUD-B/C/D - complex infrastructure, projections
9K72 / R-17 - SS-1C/D/E SCUD-B/C/D
9K72 / R-17 - SS-1C/D/E SCUD-B/C/D - status, export, sources



A missile division of 9K72 systems with 2P19 SPUs during a night launch, 1970 (photo from Rybakov's archive, http://9k72.ru , TASS)

At the position of the battery of 9K72 complexes of the 35th missile brigade of the USSR Armed Forces (photo from the archive of "Alexander", http://9k72.ru)

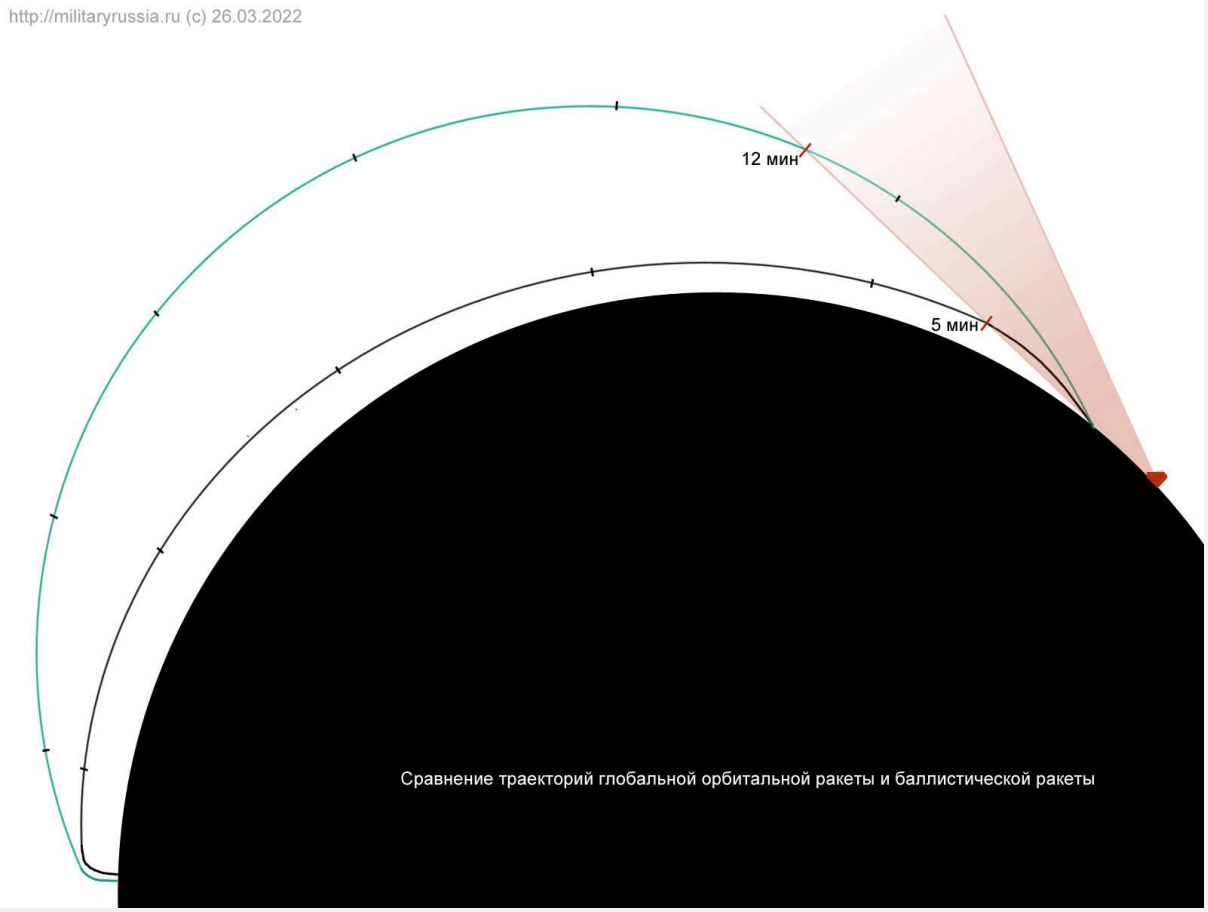
Author: DIMMI Created: 22.11.2009 21:09:15 Comments: 41 READ THE FULL ARTICLE

Global vs. Intercontinental

Global vs. Intercontinental

There is an opinion that global ballistic missiles have certain advantages over conventional ballistic missiles. I would like to understand whether this is true or not and in what situations these advantages can really be useful.

The first global missile to fly and be in service was the Soviet R-36-O - the same one that was called "partial orbital bombing system" (FOBS) in the West . With its introduction into service, the main advantages of this type of missiles became clear:
- unlimited range;
- the ability to hit a target with different missiles, but simultaneously from different directions (for example, through the North and South Poles);
- shorter flight time to the target in the shortest direction than a conventional ICBM;
- the impossibility of predicting the area where the warhead will fall while it is in the orbital portion of the flight;
- satisfactory accuracy at maximum range.



Author: DIMMI Created: 24.03.2022 17:33:50 Comments: 0 READ THE FULL ARTICLE

Indexes of missile systems of the Strategic Missile Forces

DATA AS OF 2021 (standard update)
Indices of the Strategic Missile Forces missile systems
★★★

Indices of the Strategic Missile Forces missile systems with solid-fuel missiles as of 2021:

Official name / industrial name	Type	Western designation	Complex	SPU / APU / SHPU	Rocket	Name of the SNF	Note
"Barguzin"	BZHRK				15Ж83 (source , source)		
"Perimeter-RC" / "Sirena"	PGRK		15P175		15U75 / 15Zh75 (source)		command missile based on the Topol PGRK and 15Zh58 missiles
RS-26 "Rubezh"	PGRK	KY-26 / SS-X-31		15U194 (?)	15Ж67 (source)		2015 MZKT-79291 (?) undergoes testing
RS-24 "Yars-M"	OS		15P165M1 (source)	15P765M1 (?)	15Ж65M / 15Ж65M1 / 15Ж80 (source)		MIT 2012 (15Zh65M1) 2016 (15Zh80)
RS-24 "Yars"	OS	SS-29 SS-27 mod.3 SICKLE-C / STALIN	15P165M	15P765M	15W65M	RS-12M2R	MIT
RS-24 "Yars-M" (?)	PGRK		15P155M1 (source)	15U175M1	15Ж55M1 (?)		MIT, 2012
RS-24 "Yars" / "Topol-MR"	PGRK	SS-29 SS-27 mod.2 SICKLE-B / STALIN	15P155M	15U175M	15W55M	RS-12M2R	MIT, MZKT-79221
"Speed"	PGRK		15P666		15Ж66	RSS-40	MIT
"Albatross"	OS		15P170	15P770 ?	15Ж70?		NPO Mechanical Engineering
RT-2PM1 "Topol-M"	PGRK	SS-27 SICKLE-B / STALIN	15P155	15U175	15Ж55	RS-12M1	MIT
RT-2PM2 "Topol-M"	OS	SS-27 SICKLE-B | STALIN	15P065 15P165	15P765, 15P765-18, 15P765-18M, 15P765-18E, 15P765-30, 15P765-30P, 15P765-35	15Ж65	RS-12M2	initially - Yuzhnoye Design Bureau, development of the 1st stage solid propellant rocket engine 15D365 was launched by the Design Bureau in 1988.
"Virgin Land"	PGRK		15P962	15P162, 15P662	15Ж62		MIT (source), was developed in parallel with the 15Zh61Kb "Yuzhnoye" missile, development was stopped because it became clear that such a complex would not be able to provide the necessary characteristics for combat effectiveness (source)

RT-23UTTH "Molodets"	BZHRK	SS-24 SCALPEL mod.3	15P761	15P961	15Ж61	RS-22A	Yuzhnoye Design Bureau, the decision to create an ICBM with improved characteristics was made in 1983, 1st and 2nd stage solid propellant rocket engines 15D305 and 15D339
RT-23UTTH	OS	SS-24 SCALPEL mod.2	15P060, 15P160	15P760, 15P960	15Ж60	RS-22B	Yuzhnoye Design Bureau, the decision to create an ICBM with improved characteristics was made in 1983, 1st and 2nd stage solid propellant rocket engines 15D305 and 15D339
RSS-40 "Courier"	PGRK	SS-X-26	15P159	15U160 15U160M	15Ж59	RSS-40	MIT, MAZ-7909 MAZ-7929
RT-2PM "Topol"	PGRK	SS-25 SICKLE	15P158	15U168	15Ж58	RS-12M	MIT, MAZ-7917
RT-2PM "Topol"	PGRK	SS-25 SICKLE	15P158.1 / 15P658	15U128.1	15Ж58	RS-12M	MIT, MAZ-7912
"Pioneer 3"	PGRK	SS-20 SABER mod.3 SS-X-28 SABER	15P157	15U167	15Ж57		MIT, MAZ-7916
"Horn"	PGRK		15P656		15Ж56		MIT, command rocket
"Universal" / "Topol-M" RT-2PM1 (source)	PGRK	SS-27 SICKLE-B	15P155	15U175	15Ж55	RS-12M1	MIT, chassis PGRK MZKT-79221
"Pioneer-UTTH" / "Pioneer-2"	PGRK	SS-20 SABER mod.2	15P653	15U136	15Zh54 (GC) 15Zh53 (RGCh)		MAZ-547V
RT-23 "Molodets"	BZHRK	SS-24 SCALPEL	15P952	SM-SP-35	15Ж52	RS-22	KB Yuzhnoye, solid propellant rocket motors of the first stage – 15D206 and the second stage – 15D207
					15Ж51		command missile, possibly RT-2PK (?)
"Temp-2SM2"	PGRK		15P648		15Ж48	RS-14	
"Temp-2SM1"	PGRK		15P647		15Ж47	RS-14	
RT-21M "Pioneer-K" / "Pioneer-M"	PGRK	SS-20 SABER mod.1	15P645K		15Ж46	RSD-10	MAZ-547A
RT-21M "Pioneer"	PGRK	SS-20 SABER mod.1	15P645	15U106	15Ж45 (MIG)	RSD-10	MAZ-547A
RT-23	OS				15Ж44		KB Yuzhnoye, solid propellant rocket motors of the first stage – 15D206 and the second stage – 15D207
RT-22	BZHRK			SM-SP-35	15Ж43		Yuzhnoye Design Bureau, development started in 1969, 1st stage engine 15D122
"Temp-2S"	PGRK	SS-X-16 / SS-16 SINNER	15P642	15U67	15Ж42	RS-14	MAZ-547A
RT-21	OS			SM-SP-27	15Ж41		KB "Yuzhnoye"
RT-2P	OS	SS-13 mod.2 SAVAGE	15P098P	15P798 / OS-98	8K98P	RS-12	OKB-1 / Central Design Bureau "Arsenal"
RT-2	OS	SS-13 mod.2 SAVAGE	15P098	15P798 / OS-98	8K98	RS-12	OKB-1 / Central Design Bureau "Arsenal"

...

Author: DIMMI Created: 01.08.2015 07:40:28 Comments: 8 READ THE FULL ARTICLE

Complex 9K714 Oka, missile 9M714 - SS-23 SPIDER

DATA FOR 2022 (standard update)
9K714 "Oka" complex, 9M714 / OTR-23 - SS-23 SPIDER-A missile
Complex 9K714U "Oka-U", missile 9M714U - SS-23 SPIDER-B / KY-19
R-400 - export name
★★★★★

Operational-tactical missile system of the army level. In 1972, due to the workload of the Moscow Institute of Thermal Engineering (MIT) on the creation of the mobile ICBM " Temp-2S ", at the suggestion of the Minister of Defense Industry of the USSR S.A. Zverev, the preliminary design of the OTR " Uran " was transferred to the Design Bureau of Mechanical Engineering (Kolomna) and, according to the Resolution of the Council of Ministers of the USSR No. 169-57 of March 19, 1973, work on the creation of the OTR "Oka" began on its basis there. The Design Bureau of Mechanical Engineering (hereinafter - KBM) under the leadership of S.P. Nepobedimy also used the developments of the " Rota " project.

Preparations for testing the 9M714 missile of the Oka complex began at the Kapustin Yar test site in 1975. The launch site was prepared at site 231 of the test site, the assembly and testing building at site 4c was repaired, and a canopy about 15 m high with a protective camouflage coating "Vors" was added to the building to protect against observation by space reconnaissance means. By mid-1977, the test site was ready for testing the complex. On September 27, 1977, the first meeting of the state commission for testing the Oka complex was held. The meeting was held at the Machine-Building Design Bureau in Kolomna. At the meeting, the tasks and responsibilities of each member of the commission were defined, the scope of tests and the procedure for their implementation were announced. In October 1977, the first 9M714 missile and prototypes of the complex's vehicles - the launcher, the TZM, and the preparation vehicle - arrived at the test site. The test program included launches of 31 missiles, service life and transport tests of missiles and ground equipment units, missile tests during rail transportation, tests of the complex for exposure to electromagnetic radiation, tests of the complex in hot-desert and cold climates, etc. During all types of tests, all failures, malfunctions and comments were carefully recorded, and deadlines for eliminating their causes were outlined. In mid-October 1977, the first launch of the 9M714 Oka missile was made. The launch went normally, but with an 8 km overshoot - after a thorough analysis of the control system, TsNIIAG established that the cause of the overshoot was a malfunction in the on-board processor (*source - Zakharov*).

In mid-December 1978, a trainload of equipment and an attached missile division was sent to Transbaikalia to conduct tests on the effects of subzero temperatures. Specialists from the Kapustin Yar test site and industry representatives departed by plane for Chita on January 2, 1979. The tests were conducted in the village of Bezrechnaya, where a motorized rifle regiment was stationed. The main objective of the tests was to study the effects of the lowest temperatures on equipment. A full cycle of planned tests was conducted during January 1979. Overall, the tests were successful; the missile system components showed no failures at temperatures of minus 45 degrees. The State Commission decided to launch the missile. The missile was launched on January 29, 1979, at a temperature of minus 39.5 degrees. The launch was successful (*source: Zakharov*).

The last launch of the Oka complex testing program was conducted in Kapustin Yar in mid-1981. The launch was successful, but at an altitude of 5 km the missile with the nuclear warhead simulator exploded - the cause was a malfunction in the missile engine (*source - Zakharov*).

According to other sources, missile testing at the test site began in 1976, and state testing was conducted in Kapustin Yar in 1977-1980. The first stage of joint testing

(September 1977 - August 1979) included testing the missile as a single carrier and testing the missile with a nuclear warhead. The second stage (September 1979 - July 1980) included testing the missile with a cluster warhead. According to various sources, 26 launches were made during the tests (out of the planned 31 launches), and a total of 104 9K714 missiles were launched from the Kapustin Yar test site from 1977 to 1987.

The missiles were mass-produced at the Votkinsk Machine-Building Plant beginning in 1976, and the SPU and support vehicles were produced at the Petropavlovsk Heavy Machine-Building Plant (from 1979 to 1987).

In the structure of the USSR Armed Forces, the complex was supposed to be used as a high-precision combat element of reconnaissance-strike (RUK) and reconnaissance-fire (ROK) complexes. The 9K714 Oka complex was accepted into service in 1980 and began to enter service, partially replacing the 9K72 SCUD-B complexes . The first missile brigade armed with the complex was the 189th Missile Brigade (Stankovo, Belorussian Military District), formed on the basis of the district RBR. In 1981, the complex was discovered by Western reconnaissance assets and identified as SS-23 SPIDER. In December 1987, the complex fell under the restrictions of the INF Treaty and was reduced. Work on the Oka-U modification was stopped in 1987 at the stage of preparation for serial production and adoption into service.

The name "OTR-23" was used in the documentation for the INF Treaty. By default, the data of the base missile is 9M714.

Special thanks to "Pensioner" (http://russianarms.ru) for assistance in preparing materials.

Missile system 9K714 "Oka" - SS-23 SPIDER. SPU 9P71 of the Slovak Army with a missile with a cluster warhead (photo by Myroslav Gyurosi, http://galerie.valka.cz , processed).

Author: DIMMI Created: 30.03.2009 01:02:48 Comments: 116 READ THE FULL ARTICLE

9K310 Igla-1 - SA-16 GIMLET

DATA AS OF 2022 (standard replenishment)
9K310 Igla-1 complex, 9M313 missile - SA-16 GIMLET

Man-portable air defense system (MANPADS). Developed by the Design Bureau of Mechanical Engineering (Kolomna). The development of the main project of the Igla MANPADS was started in 1971. By the decision of the Military-Industrial Complex under the Council of Ministers of the USSR dated May 6, 1978, No. 114, simultaneously with the development of the Igla complex, KBM (Kolomna) began work on the creation of a simplified man-portable air defense system Igla-1 using a modified thermal seeker from the Strela-3 complex missile in the anti-aircraft missile .

The Igla-1 MANPADS was developed by the following cooperation of enterprises:
- the complex and the missile - Design Bureau of Mechanical Engineering of the Ministry of General Mechanical Engineering (KBM MOM, Kolomna);
- IR homing head - Design Bureau of the Frunze Arsenal Plant of the Ministry of General Machine Building (KBAF MOM, Leningrad);
- safety-actuating mechanism (SAM) - Poisk Research Institute of the Ministry of Defense Industry (Murino, Leningrad Region);
- solid fuel for solid-propellant rocket motors - Soyuz Scientific Production Association of the Ministry of Defense Industry (Dzerzhinsky, Moscow Region).

Serial production of the 9K310 Igla-1 MANPADS was carried out at the Kovrov Arms Plant named after V. A. Degtyarev (Kovrov) . The homing heads were produced by the Leningrad Optical-Mechanical Association (LOMO), solid rocket fuel was produced by the Morozov Plant (Leningrad Region), and the operator's tablet (OT) was produced by the Izhevsk Electromechanical Plant of the Ministry of Radio Industry (IEMZ MRP, Izhevsk , Udmurtia).

Joint tests of the Igla-1 MANPADS consisting of a missile in a launch tube, a launch mechanism with a ground-based radar interrogator , and a portable electronic tablet were conducted from January 15 to July 9, 1980 at the Donguz test site (test site chief V.I. Kuleshov) under the supervision of a commission headed by Yu.I. Tretyakov. The system successfully passed the tests.

A simplified version with reduced characteristics, the 9K310 Igla-1, was adopted by the Soviet Army by the Resolution of the CPSU Central Committee and the USSR Council of Ministers of March 11, 1981 .

Models of MANPADS (top to bottom) 9K333 "Verba", "Igla-S", "Igla" and "Igla-1" as part of the exhibition at the conference "Problems of Theory and Practice of Development of Ground Forces Air Defense Forces in Modern Conditions", Smolensk, June 2013 (source).

Author: DIMMI Created: 08.03.2022 21:26:45 Comments: 1 READ THE FULL ARTICLE

9K34 Strela-3 - SA-14 GREMLIN

DATA FOR 2014 (in progress)
The 9K34 Strela-3 complex, the 9M36 / 9M36-1 missile - SA-14 GREMLIN
★★★

Man-portable air defense system (MANPADS). It was created under the supervision of S.P. Nepobedimy in the Machine-Building Design Bureau (Kolomna). The development of the MANPADS was started by the Resolution of the USSR Council of Ministers of September 2, 1968 - the same Resolution specified the creation of the Strela-2M MANPADS .

Joint tests of the MANPADS consisting of the 9M36 SAM in the 9P59 launch tube and the 9P58M launch mechanism were held at the Donguz test site from November 1972 to May 1973 (the test site chief at that time was O.K. Dmitriev) under the supervision of a commission headed by D.A. Smirnov. During the tests, shortcomings related to the insufficient reliability of the onboard SAM equipment element base were identified and eliminated.

By the Decree of the USSR Council of Ministers of January 18, 1974, the complex was accepted into service. The State Prize for its creation was awarded to L.G. Deyev, E.A. Oleynikov, A.S. Yablonsky, M.N. Diktov, I.K. Polosin, V.V. Golovatenko, Yu.I. Fedorovsky, G.V. Izyurov, A.M. Cheprakov and others (source). Serial production of the MANPADS was carried out at the V.A. Degtyarev Plant (Kovrov) from 1973 to 1981.

MANPADS 9K34 "Strela-3" (c) http://militaryrussia.ru

Author: DIMMI Created: 13.06.2014 21:04:27 Comments: 3 READ THE FULL ARTICLE

9K338 Igla-S - SA-24 GRINCH

DATA AS OF 2017 (standard replenishment)
9K338 Igla-S / Igla-Super complex, 9M342 missile - SA-24 GRINCH
★★★

Man-portable air defense system (MANPADS). Developed by the Machine-Building Design Bureau (Kolomna), chief designer - R.V. Fokin, as a modernization of the 9K38 Igla MANPADS. The MANPADS was created using the developments and experience of creating the Igla-D MANPADS with a collapsible launch tube and the Igla-N with a new, more powerful warhead. A special feature of the complex is the ability to engage targets from all angles, including small-sized targets (cruise missiles, UAVs). State tests were completed in December 2001; the complex was accepted into service with the Russian Armed Forces. Serial production of the complexes has been carried out by JSC "V.A. Degtyarev Plant" (Kovrov) since December 1, 2004 (*idelf.ru*), some of the units of the complex have been produced by the Serpukhov Metallist Plant (steering machines, aerodynamic control surface unit, etc.) since at least 2008.

The following components of the SAM system have been newly developed for the Igla-S complex: seeker head, cruise engine, missile instrument compartment, steering machines, warhead, booster engine, tube, battery, etc.

9K338 Igla-S MANPADS on a support device with a 9S520 set of means, MAKS-2009 air show (photo - A.V. Karpenko, http://bastion-karpenko.narod.ru/).

Author: DIMMI Created: 10/31/2010 10:18:44 PM Comments: 58 READ THE FULL ARTICLE

Corona-ICBM / Hwasong-16

DATA FOR 2020 (standard update)
Corona-ICBM / Hwasong-16
★★★

An intercontinental ballistic missile, first shown at the parade in Pyongyang on 10.10.2020. The name "Corona-ICBM" is conditional, the name Hwasong-16 is tentative.

A two-stage ICBM with liquid engines of the 1st and 2nd stages. A new type of transport unit with 11 axles (some of the axles are leading) with spaced cabins - to reduce the height of the payload and accommodate a long missile with an optimal transport altitude. The missile is launched in the same way as in the case of previous DPRK ICBMs from the launch pad. In fact, the self-propelled launcher is a transporter-installer of the missile on the launch pad, similar to the first Soviet mobile IRBMs. The start is hot on the cruise engines of the 1st stage of the missile. It is believed that the first stage of the rocket is an analogue of the first stage of the promising Unha-X launch vehicle.

Presumably, the 1st stage has 4/6 single-chamber liquid-propellant rocket engines similar

Intercontinental ballistic missile (ICBM), first shown at the parade in Pyongyang 10 October 2020 The name "Corona-ICBM" is conditional, the name Hwasong-16 is probably.

Two-stage ICBM with 1st and 2nd stage liquid engines. A new type of TEL with 11 axles (some of the axles are leading) with spaced cabins - to reduce the height of the payload and accommodate a long rocket with an optimal high in transport position. The missile launched from launch pad like previous DPRK ICBMs. In fact, a TEL is a carrier-launcher for a missile on a launch pad, similar to the first Soviet mobile MRBMs. Hot start on main rocket engines of the 1st stage. It is believed that the first stage of the rocket is an analogue of the first stage of the promising Unha-X launch vehicle.

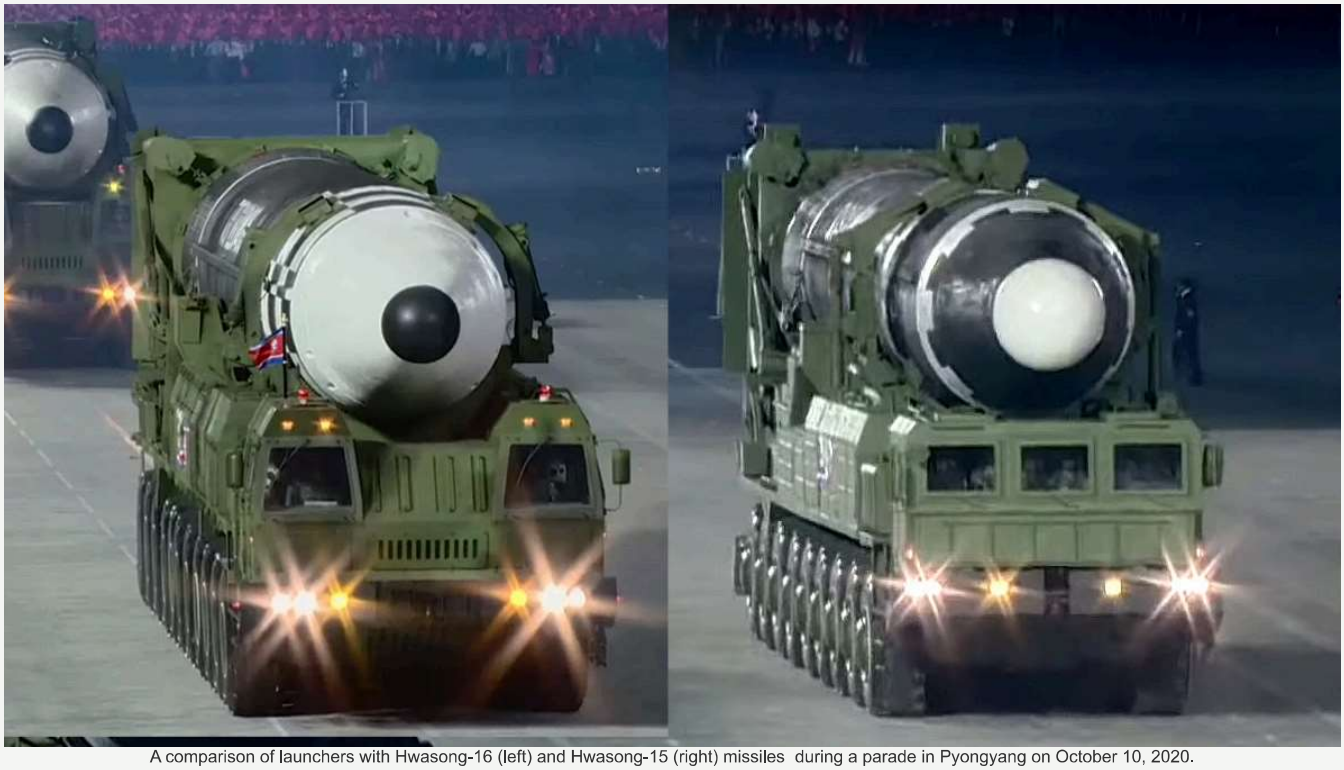
to the propulsion systems of the GR-1 and R-36 rockets. The steering engines of the 1st and 2nd stages were presumably removed from the rocket samples shown at the parade. Some estimates indicate a rocket diameter of 3 meters, but it seems to me that the diameter of the 1st stage does not exceed 2.7 m, and due to the different heights of the HS-16 and HS-15 rockets on the launchers, experts are mistaken in their estimates. The stage probably has an increased number of liquid-propellant rocket engine chambers from 2 to 4. The warhead separation stage probably ensures the use of MIRV. Although it is too early to give any specific estimates.

Of course, we are shown only mock-ups, not actual missiles. This is a common practice in the recent history of North Korean missile engineering. Of course, this does not rule out the possibility of testing the said missile in the coming months.

Presumably, 4/6 single rocket engines are installed at the 1st stage, similar to the propulsion systems of the soviet GR-1 and R-36 missiles. The steering motors of the 1st and 2nd stages were presumably taken from the samples of missiles shown at the parade. Some estimates point to a rocket diameter of 3 meters, but it seems to me that 1st stages diameter is no more than 2.7 meters and increase in the rocket engine chambers from 2 to 4. Because some experts in their estimates of high of TEI with missiles HS-15 and HS-16 had mistakes. Upper stage had the ability to use MIRV warheads. Although it is too early to give some correct estimates.

Of course, we are shown only mock-ups, not real samples of missiles. In recent history of North Korean rocketry, this is a common practice. Of course, this does not negate the likelihood of testing this missile in the coming months.

A Hwasong-16 intercontinental missile is shown during a parade in Pyongyang on October 10, 2020.



A comparison of launchers with Hwasong-16 (left) and Hwasong-15 (right) missiles during a parade in Pyongyang on October 10, 2020.

Author: DIMMI Created: 11.10.2020 11:23:43 Comments: 4 READ THE FULL ARTICLE

Error identifying ICBM RS-28 Sarmat

Error identifying ICBM RS-28 "Sarmat"

A few days ago, sensational information appeared in the new non-native English-language blog Missiles Underground about the discovery of a report by some missile ecologists about the first throw-off launch of the heavy liquid-fueled RS-28 / 15A28 Sarmat ICBM (the article about the missile on our site is temporarily closed at the request of the court). The Missiles Underground blog posted a photo of the burning remains of one of the stages of a certain missile, indicating that these were the consequences of the first throw-off launch of the Sarmat ICBM in December 2017 at the Plesetsk test site and WITHOUT indicating the source of this information. The analysis and search allowed us to find the original source of the photographs - this is the news of the company NPC Ecopromsertefika (link to the news), which really talks about the company's performance of a set of works on environmental support for the throw-off tests of the "128" complex at the Plesetsk cosmodrome in December 2017. But with the photographs, everything is a little different:

Original photo of the rocket from the news, photo #1 (link to the news)

Author: DIMMI Created: 11.09.2020 09:35:30 Comments: 1 READ THE FULL ARTICLE

System A-135 Amur / 5Zh60 / RTC-181

DATA AS OF 2018 (standard replenishment)
A-135 Amur-P / 5Zh60P missile defense system (test site sample)
A-135 Amur / RTC-181 / 5Zh60 missile defense system
★★★★

Multi-channel missile defense system of the Central Industrial Region and the city of Moscow. The development of a modernized version of the A-35 missile defense system - the A-35M system was carried out by NIO-4 OKB-30 under the leadership of G.V. Kisunko from the mid-1960s until his removal in 1975.

According to the memoirs of the first commander of the ABM and Air Defense Forces Yu.V. Votintsev (*history - Rubezhi*), in the summer of 1967, the Military-Industrial Complex Commission under the USSR Council of Ministers reviewed draft designs of promising missile defense systems with various radars (the basis of any missile defense system is a radar with a computing center):

- Aurora system with Istra radar (G.V.Kisunko)
- project of the system with the multifunctional radar "Don-N" (A.L. Mintz)
- Radar "Neman" (Yu.G.Burlakov)

According to the preliminary design, the Don-N radar was a sector multifunctional radar for detecting ballistic targets and guiding anti-missiles with phased array. Apparently, the Don-N radar was chosen as the main one for the future A-135 missile defense system, and a decision was made to build and test range samples of all radars. Based on the results of state tests in 1980, the Don radar was finally selected for further implementation out of three radars - Neman, Don-2NP and Istra-2 - for use in the A-135 missile defense system (*source - Radar technologies*).

In parallel with G.V. Kisunko, work on the preliminary justification for the creation of a new second-generation missile defense system, on the instructions of Minister V.D. Kalmykov, was started at the end of 1968 by a group of the USSR Ministry of Radio Industry under the leadership of A.G. Basistov. By the end of 1969, the concept of a two-tier missile defense system was generally agreed upon with the USSR Ministry of Defense. It was assumed that anti-missiles with nuclear warheads would be used.

In 1970, the missile defense theme was completely transferred to the control of the USSR Ministry of Radio Industry - on January 17, 1970, the specialized TsNPO Vympel (AMD, missile attack warning systems and space control) was formed, the head of the scientific and technical center of TsNPO Vympel was A.G. Basistov. The development of the future missile defense system in the STC TsNPO Vympel was carried out on the topic of the R&D project "Fon-1".

The USSR Council of Ministers Resolution No. 376-119 on the creation of the A-135 missile defense system with the Amur long-range interception firing complex and the Amur-P test site prototype was issued on June 10, 1971. The first project of the A-135 missile defense system was developed by the Vympel Central Research and Production Association in 1971 under the supervision of A.G. Basistov. The project envisaged the creation of three Amur firing complexes at a distance of 600-800 km from Moscow and three S-225 short-range interception complexes , which would minimize the damage from the use of anti-missiles with nuclear warheads in the long-range missile defense echelon and increase the reliability of intercepting attacking warheads. In December 1971, the preliminary design of the A-135 system (Research Institute of Radio Instrumentation - NIIRP - USSR Ministry of Radio Industry) and the preliminary design of the Amur firing complex (STC TsNPO Vympel, chief designer - A.G. Basistov)

were completed.

Radar "Don-2N" / PILL BOX of the A-135 missile defense system, Sofrino-1 settlement, 12/28/2011 (photo by Leonid Varlamov, http://mmet.livejournal.com).

Author: DIMMI Created: 05.11.2018 12:25:05 Comments: 5 READ THE FULL ARTICLE

S-225 Azov system, 5Ya26 and 5Ya27 missiles - ABM-X-3

DATA AS OF 2021 (standard replenishment)
S-225 system, V-757 missile
S-225 system, V-758 and V-825 missiles
S-225 system, Azov complex - ABM-X-3
5Ya26 / PRS-1 missile - ABM-X-3A GAZELLE / SH-08
5Ya27 / V-825 missile - ABM-X-3B Project of a universal limited mobility air defense system with missile defense capabilities / object-based missile defense system with a high-speed anti-missile and a medium-range anti-missile. The preliminary design is based on the developments of NII-648 on the Saturn
★★★★★

missile defense system , which, after the closure of the topic, with the assistance of V.N. Chelomey, were transferred to KB-1 (later renamed Almaz Central Design Bureau, now Almaz-Antey OJSC) of A.A. Raspletin. The decision of the Military-Industrial Committee of the USSR Council of Ministers to develop a limited-object missile defense system against promising aerodynamic targets and single medium-range ballistic missiles was made in May 1961. Later, the system was also tasked with repelling a single ICBM strike. The development of the missile defense system was entrusted to KB-1 of the USSR Ministry of Radio Industry (Minister - V.D. Kalmykov). The general designer of KB-1 was A.A. Raspletin, and from March 1967 - B.V. Bunkin. The chief designer of the S-225 missile defense system was V.M. Shabanov, later - V.D. Sinelnikov. The development of the first version of the preliminary design for the system began in 1961 in the KB-1 thematic laboratory under the supervision of V.I. Markov (until 1963), deputy chief designer was K.K. Kapustyan. At the initial preliminary design stage, it was assumed that the Program radar (chief designer Yu. G. Burlakov) would be used as a target designation radar, and that a promising missile with solid-fuel ramjet engines developed by OKB-2 MAP (MKB Fakel) under the chief designer P. D. Grushin (prototype - V-757 missile) would be used as an anti-missile. The preliminary preliminary design of the S-225 firing system was completed at the end of 1961. It was planned that the system would include a command post, radio equipment and missile launchers. By Resolution of the USSR Council of Ministers No. 660-270 of June 29, 1962 and Resolution No. 499-174 of May 4, 1963, the creation of the S-225 anti-aircraft guided weapon system was entrusted to KB-1 of the Ministry of Radio Industry and OKB-2 of the USSR Ministry of Aviation Industry. After reviewing the report on the tests of the Verba, Kaktus and Krot missile defense countermeasures, work began on developing ways to select real targets in a group ballistic target. A decision was made to use atmospheric target selection - when entering the dense layers of the atmosphere, the warheads continue to move, and light false targets are filtered out. This selection method required increasing the requirements for the interceptor missile. Development of an updated missile defense system project to combat hypersonic aerodynamic targets and ballistic missiles was started by KB-1 in June 1962 under the leadership of T.R. Brakhman and K.K. Kapustyan. *Special thanks to "vuv" (http://militaryrussia.ru/forum/*

) and other veterans of the S-225 tests for their assistance in working on the material.

Radar with phased array RSN-225 / FLAT TWIN of the measuring complex 5K17, Kamchatka. The radar is captured before being painted green. (Photo from the archive of the Military-Industrial Complex, Dementyev G. SMU-304 - GPTP "Granit" - JSC "GNPO "Granit". // Military-Industrial Courier. No. 7 / 2007).

Author: DIMMI Created: 28.03.2010 16:32:53 Comments: 175 READ THE FULL ARTICLE

9K713 Agat (project)

DATA FOR 2020 (standard update)
Complex "Agat"
Complex 9K713 (?) "Agat-1" - STERLITE (?)
★

Frontline missile system / extended-range operational-tactical missile system. The system was developed based on the Elbrus system project by the Moscow Institute of Thermal Engineering, chief designer - A.D. Nadiradze. The development of the Agat-1 ground-based ballistic missile system and the Agat air-launched ballistic missile system was carried out by order of the Ministry of Defense Industry and the Ministry of Aviation Industry of July 27, 1978 (source). The land-based version of the system was created as part of a competition to replace the Temp-S extended-range operational-tactical missiles, in which the Volga system project by the Design Bureau of Mechanical Engineering also participated . Work on the Agat system did not leave the design stage.

The NATO name - STERLITE - was assigned by us presumably based on the Globalsecurity.org message (see export).

The GRAU index 9K713 is presumably associated with the Agat complex.

Author: DIMMI Created: 01.10.2009 00:50:29 Comments: 1 READ THE FULL ARTICLE

9K712 Elbrus (project)

DATA AS OF 2020 (standard replenishment)
Complex 9K712 "Elbrus"
★★★

Frontline missile system / extended-range operational-tactical missile. Most likely, the development of the missile was started by the Resolution of the Council of Ministers of the USSR No. 959-319 of October 17, 1967. The development of the complex was carried out by the Moscow Institute of Thermal Engineering (MIT) in the early 1970s. The missile was created to replace the Temp-S missile system , taking into account the probable appearance of the SAM-D SAM system (in the future - the Patriot SAM system) in service with NATO countries. Accordingly, the design of the Elbrus missile was supposed to use the missile defense penetration system developed for the Temp-2S strategic complex, as well as other state-of-the-art solutions at that time. A project for a naval version of the Elbrus-M missile was also considered, including in a non-toxic configuration for placement on a Project 1080 carrier ship of the USSR Navy.

Chief designer - A.D. Nadiradze, senior project engineer and head of the Elbrus theme - Yu.S. Solomonov (future director and general designer of MIT). The preliminary design of the complex was released in 1971. The draft design of the complex was defended at the end of 1973. The technical proposal for the development of the missile complex is dated 1974. Work on the Elbrus complex was stopped in 1979 due to MIT being overloaded with work on the creation of strategic missile complexes.

The GRAU index 9K712 is presumably associated with the Elbrus complex.

The autonomous launcher of the Elbrus complex was planned to be placed on the BAZ Osnova chassis. In the photo is the prototype of the BAZ-6944 Osnova chassis, 1979 (source).

Author: DIMMI Created: 29.03.2009 23:56:55 Comments: 7 READ THE FULL ARTICLE

A-235 / RTC-181M / ROC Samolet-M

DATA AS OF 2020 (standard replenishment)
A-235 / RTC-181M / ROC "Samolet-M" system, 58R6 complex, 53T6M / 45T6 missiles
★★★

Multi-channel missile defense system. The development of a modernized version of the A-135 missile defense system was prescribed by Resolution of the USSR Council of Ministers No. 585-119 on the construction of the A-135 system , which was issued on June 7, 1978. The design of the system was started by NIIRP TsNPO Vympel in 1985, General Designer - A.G. Basistov (until 1998), Chief Designer - B.P. Vinogradov. In accordance with the Resolution of the USSR Council of Ministers dated 15.07.1985 No. 661-202, NIIRP, as a division of TsNPO Vympel, is the lead enterprise of Russia for the multi-echelon missile defense system as a whole, for the ground-based missile defense system and the information support system for the missile defense system. The first draft design of the A-235 missile defense system was proposed by A.G. Basistov in 1985.

According to the 1985 design, it was proposed to include in the A-235 missile defense system (*source - Pervov*):
- command and computer launch (KVP)
- the Kiev radar complex for information support of firing complexes;
- multi-channel two-echelon firing complexes "Kivach" with the multi-channel radar "Narva" and anti-missiles of the MKB "Fakel" and OKB "Novator";
- firing complexes "Ilek" with a mm-range radar;
- multi-channel firing complex "Amur" of the A-135 missile defense system;
- optical-electronic information complex of air-based "Onega";
- launch positions;
- missile and technical bases.

The development of the system project was carried out in 1985-1989.

Initially, the A-235 system was planned to be three-echelon: long-range echelon with A-925/51T6 missile defense missiles , middle echelon - 58R6 firing complex, short-range echelon - PRS-1M/45T6 missiles (the result of the modernization of PRS-1/53T6 missiles).

State contract No. 406/1591 dated 31.01.1991 was concluded with NIIRP for the modernization of the missile defense system, work on expanding the combat capabilities of the A-135 system in terms of increasing the far boundary of the engagement zone, increasing the maneuverability of the missile, and equipping the missiles with a new warhead (all together - R&D "Samolet-M"). The name of the missile and technical complex of the modernized Moscow missile defense system is RTC-181M. The readiness date of the modernized version under the state contract is 2015. According to the Decree of the President of Russia dated 17.02.1995 No. 163, NIIRP is designated as the lead enterprise for the modernization and improvement of the Moscow missile defense system - the RTC-181 system - and the creation of the RTC-181M system. General Designer - A.G. Basistov. After the death of A.G. Basistov in 1998, B.P. Vinogradov became the general designer of NIIRP.

All data on the system are hypothetical and taken from open sources and the media. The list of sources is attached.

Radar "Don-2N" / PILL BOX of the A-135 missile defense system, Sofrino-1 settlement, 12/28/2011 (photo by Leonid Varlamov, http://mmet.livejournal.com).

Author: DIMMI Created: 01.04.2010 22:53:35 Comments: 50 READ THE FULL ARTICLE

R-26 / 8K66 - SS-8 SASIN (wrong)

DATA AS OF 2020 (standard replenishment)
Missile R-26 / 8K66 - "SS-8 SASIN" (the name is erroneous)
★★★

Intercontinental ballistic missile (ICBM). The missile was developed by OKB-586 (now - Design Bureau "Yuzhnoye", Dnepropetrovsk, General Designer - M.K. Yangel) in accordance with the Resolution of the Council of Ministers of the USSR dated May 23, 1960 on the development of the R-26 missile, which was created to replace the R-16 ICBM. The resolution stipulated that flight design tests would begin as early as December 1961.

The missile was created as a replacement for the R-16 ICBM, but with smaller dimensions and with the ability to keep the missile fueled for up to one year, that is, 12 times longer than the R-16. The missile was originally designed for silo-based deployment. In March 1961, the preliminary design of the rocket was defended. M.I. Galas was appointed as the leading designer of the 8K66 product (until early June 1962), and Yu.A. Andrianov was his assistant.

On May 23, 1961, the USSR Council of Ministers adopted Resolution No. 548-223, specifying the requirements for the missile: the R-26 missile was to be equipped with the same charge as the R-16 and R-9A ICBMs, had to have a range of 11,500-12,000 km with a launch weight of about 85 tons. Silo-based launch was set as the main option, and it was also necessary to develop an unprotected launcher. OKB-586 was determined to be the lead developer, and a cooperation of enterprises that participated in the creation of the R-16 ICBM was involved as co-executors. The design of the combat launch site was entrusted to the Leningrad TsKB-34, which was almost simultaneously working on the silo launch for the R-16. Joint flight tests were planned from the first quarter until the end of 1962.

The reduction in the dimensions of the R-26 missile compared to the R-16 was achieved as follows:
- the energy capabilities of the R-16 (like the R-9A) were somewhat excessive for the combat equipment used, providing a range reserve of at least 1000 km.
- the payload of the missile is determined by the weight of not only the warhead, but also the control system equipment. In this regard, the designers of OKB-586 achieved the inclusion in the government decree of a control figure for the weight of this equipment - 200 kg for the second stage, which corresponded to a lightening of almost 1.5 times compared to the R-16.
- the Decree stipulated a reduction in the mass of the warhead charge by 15% compared to the real sample tested in 1958.

From March to June 1962, NII-229 conducted firing rig tests of both stages of the rocket. During the testing of "hot" stage separation, it was planned to launch the second stage engines with the first stage mock-up attached. Earlier, during the rig tests of the first stage of the R-16 ICBM, the rig was destroyed, and now NII-88 representatives expressed concern that the first stage of the R-26 rocket, which fell during separation, would damage the integrity of the rig tray, and the jet from the second stage engine would destroy the rig. To avoid destruction of the rig, the testers attached an ordinary railroad tie to the body of the first stage mock-up as a kind of shock absorber. After the tests were successfully completed, the railroad tie was packed, sealed by representatives of the Quality Control Department and the Customer, and sent "for examination" to NII-88.

Special thanks to "Praktik" (http://military.tomsk.ru/forum) for assistance in preparing the materials.

R-26 missiles at a parade in Moscow, November 7, 1964.

Author: DIMMI Created: 04.04.2011 12:27:02 Comments: 30 READ THE FULL ARTICLE

Complex 14Ts034 Peresvet / R&D Corrector

DATA AS OF 2020 (standard replenishment)
R & D "Ispravitel"
Complex 14Ts034 "Peresvet"

Combat mobile laser complex / complex for counteracting the functioning of optical means of artificial satellites. In the annual report of the IAC "Vympel" of the Almaz-Antey Air Defense Concern for 2010, it was stated that one of the company's tasks is " the creation of an anti-space defense system (anti-satellite warfare) of the first stage of development based on the existing scientific and technical reserve and newly created ground- and air-based anti-space defense systems for fire destruction and functional suppression of low-orbit foreign military spacecraft" (source). It is assumed that for the functional suppression of the operation of the electronic-optical means of the artificial satellites of a potential enemy, it was proposed to use medium-power laser systems. In 2012, the Russian Ministry of Defense announced a competition to conduct R & D "Study of ways to create a land-based mobile laser system for thermal and functional destruction of air targets" code "Ispravitel". The competition announced by the Ministry of Defense on June 28, 2012 was won by the State Educational Institution of Higher Professional Education "Bauman Moscow State Technical University". State contract for the implementation of R & D No. 847/3K/2012/ДРГ3 was concluded on July 18, 2012 (ist - Resolution). In addition to Bauman Moscow State Technical University, GSKB Almaz-Antey also participated in the competition. The work on the first stage of the R & D "Ispravitel" was completed by Bauman Moscow State Technical University in full in 2012 and accepted by the Russian Ministry of Defense (ist - Resolution). On August 3, 2016, Russian Deputy Defense Minister Yuri Borisov, speaking at a meeting dedicated to the 70th anniversary of the Russian Federal Nuclear Center in Sarov, said that prototypes of systems using new physical principles had entered service with the Russian Armed Forces. On March 1, 2018, in a speech before the Federal Assembly of Russia, V.V. Putin publicly presented for the first time a combat anti-aircraft laser system, which was later named "Peresvet". The footage of the deployment of the combat laser system shown in the video was likely filmed in 2017. On March 12, 2018, the Russian Deputy Defense Minister said that the system was accepted into service in 2017 and uses a nuclear power plant (source). There are no public performance characteristics of the system or data on the developer of the system as of August 2018. ★★★

The Peresvet combat mobile laser system in combat position, presumably 2017 (frame from a video by the Russian Ministry of Defense, 01.03.2018).

Author: DIMMI Created: 13.09.2012 07:39:45 Comments: 20 READ THE FULL ARTICLE

OCD Lightning

DATA AS OF 2020 (standard update)
R&D project "Molniya"
★★

Long-range exoatmospheric interceptor missile of the prospective missile defense system / program for the creation of new types of anti-missile equipment. Work on the R&D project "Molniya" was carried out by NIIRP in the 1980-1990s. The head of the topic at NIIRP is Oleg Vasilyevich Golubev (source). Probably, the interceptor missile was created as part of the work on the creation of theA-235(R&D project "Samolet-M" / "Samolet-Molniya"?). The development of a modernized version of theA-135was mandated by Resolution of the USSR Council of Ministers No. 585-119 on the construction of theA-135, which was issued on June 7, 1978. The design of the A-235 system was carried out by the NIIRP TsNPO Vympel since 1986, the general designer was A.G. Basistov (until 1998), the chief designer was B.P. Vinogradov. After the death of A.G. Basistov in 1998, B.P. Vinogradov became the general designer of the NIIRP. In accordance with the Resolution of the USSR Council of Ministers dated July 15, 1985 No. 661-202, the NIIRP, as a division of TsNPO Vympel, is the lead enterprise of Russia for the multi-echelon missile defense system as a whole, for the ground-based missile defense system and the information support system for the missile defense system. The first draft design of the A-235 missile defense system was probably approved in 1985-1986.

Initially, the A-235 system was planned to be three-tiered: a long-range tier with missile defense missiles similar tothe A-925/51T6, a middle tier — the 58R6 firing complex, and a short-range tier — PRS-1M/45T6 missiles (the result of upgradingthe PRS-1/53T6). State contract No. 406/1591 dated 31.01.1991 was concluded with NIIRP for the modernization of the missile defense system, work to expand the combat capabilities of theA-135in terms of increasing the long-range boundary of the engagement zone, increasing the maneuverability of the missile, and equipping the missiles with a new warhead (all together -the Samolet-M R&D project).

The development of the long-range intercept missile was carried out on the basis of and as a replacement for theA-925/51T6. Developer - Almaz Central Design Bureau. Since 1990, as part of the work to expand the combat capabilities of the A-135 missile defense system, work was carried out on the Molniya and Kopye-2A programs (*source - Shield of Russia...*). In 1993, testing under the program to create a non-nuclear exoatmospheric interceptor Molniya (as well as Kopye-2A and Pika-M) was planned to be carried out at the Sary-Shagan test site before 2000 (*source - Unique...*). Tests of the missile or its prototype were probably carried out at the Sary-Shagan test site in October-November 2007 (*source - Starostin V.*).

All data on the system are hypothetical and taken from open sources and the media. The list of sources is attached.

Long-range interceptor missile tested under the Molniya R&D project, Sary-Shagan test site, probably 2007 (photo - Mikhail Pervov, http://www.moskva-kniga.ru).

Author: DIMMI Created: 12.02.2012 23:48:28 Comments: 11 READ THE FULL ARTICLE

KTRV/GZUR hypersonic missile (project)

DATA FOR 2020 (standard update)
KTRV/GZUR hypersonic missile (project)
★★

Hypersonic cruise missile / hypersonic guided missile (GZUR) project. Research and development work on the hypersonic cruise missile was started by the Dubna division (former MKB Raduga) of the Tactical Missile Weapons Corporation as of August 2011. The General Designer and General Director of the Tactical Missile Weapons Corporation (TRV) is Boris Obnosov. By December 2017, the source spoke of a joint development by the Dubna MKB Raduga and the head office of KTRV in Korolev.

It is possible that the results of tests on the topic of R&D "Kholod-2" and the experience of creating the experimental hypersonic vehicle "Igla" (Baranov Central Institute of Aviation Motors) will be used in the creation of the new missile.

On 23.04.2013, the media reported that by the beginning of summer 2013, a target program for the creation of hypersonic weapons by the TRV corporation would be developed: "A permanent working group has been formed on the basis of the corporation, within which there are 10 subgroups in various areas." In the summer of 2013, it is planned to defend the program at the Military-Industrial Complex under the Government of Russia (source).

On 28 August 2013, Russian media reported that "a hypersonic missile has been created by the TRV corporation, but so far it has only flown for a few seconds" - this was a free paraphrase of B. Obnosov's statement at the MAKS-2013 air show that missiles had already been created in Russia that could fly at a speed of 4.5M for a few seconds (apparently referring to the tests of the Kh-90 and Kholod missiles in the 1980s and 1990s).

The name "GZUR" was first mentioned on 22.12.2017 in a source - here information is also provided that the missile is probably undergoing testing and from 2020 it is planned to begin serial production of the missile at a rate of up to 50 units per year.

Author: DIMMI Created: 19.08.2011 14:53:28 Comments: 10 READ THE FULL ARTICLE

RT-20P - SS-X-15 SCROOGE

DATA AS OF 2011 (standard replenishment)
Complex 15P699, missile RT-20P / 8K99 - SS-XZ / SS-X-15 SCROOGE
Complex 15P099, missile RT-20P / 8K99 (silo)
★★★

Intercontinental ballistic missile (ICBM) / road-mobile missile system. The complex was developed by OKB-586 (now - Yuzhnoye Design Bureau, Dnepropetrovsk, General Designer - M.K. Yangel), the lead designer of the complex was B.A. Kovtunov (since 1964). By the Resolution of the USSR Council of Ministers No. 316-137 dated April 4, 1961, OKB-586 was offered on a competitive basis with OKB-1 during 1961-1962. Together with related organizations, carry out the relevant R&D work with its subsequent transfer to R&D. The R&D work is based on the technical specifications of the USSR Ministry of Defense for the creation of a small-sized solid-fuel ICBM with a launch weight of 25 tons.

A broad cooperation of design bureaus and enterprises in various areas was involved in the work on the OKB-586 R&D:
- development of high-energy mixed solid propellants, charges and their technology - NII-6, NII-130, GIPH, Plant No. 55 of the Dnepropetrovsk Economic Council;
- development of structural, heat-resistant and heat-shielding materials and technology for the manufacture of solid-propellant rocket motor bodies and units - NII-13, NII-88, VIAM, institutes of the Academy of Sciences of the Ukrainian SSR, NIIGrafit and VNIITS of the Moscow Economic Council, NITI-40, UkrNITI;
- development of on-board and ground control system equipment, electrical equipment, power supplies and cable network - OKB-692, NII-944, VNIIEM, VNIIT, NIAI, OKB-686;
- development of combat equipment - KB-11 of the USSR Ministry of Medium Machine Building;
- comprehensive development of launch options - TsKB-34;
- conducting theoretical and experimental research, developing methods for calculating solid-propellant rocket motors - NII-1, TsAGI, NII-88, NII-6, NII-130, GIPH, MVSSO USSR, MVSSO RSFSR, ISM AS UkrSSR.

Special thanks to "Praktik" (http://military.tomsk.ru/forum) for assistance in preparing the materials.

SPU 15U51 on the "object 821" chassis of the RT-20P ICBM - SS-X-15 SCROOGE at the parade in Moscow, 11/07/1967 (http://militaryphotos.net).

Author: DIMMI Created: 05.04.2011 22:59:25 Comments: 103 READ THE FULL ARTICLE

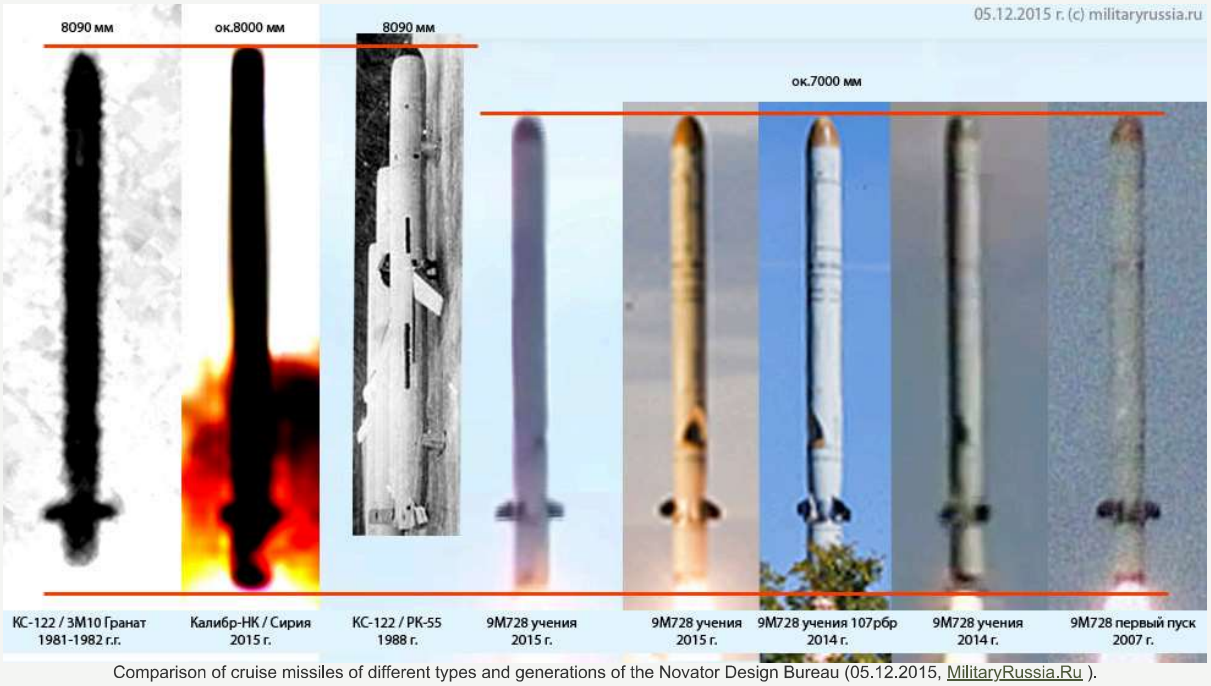
Missile 9M729 - SSC-X-8

DATA FOR 2018 (standard update)
Missile 9M729 - SSC-X-8

A missile system with a land-based long-range cruise missile. According to Western data, the missile is a land-based version of the 3M14 missile of the Kalibr-NK missile system (or something similar) and was developed by the Novator Design Bureau (Yekaterinburg). The creation and testing of such a missile in a land-based version is recognized by Western observers as a violation of the INF Treaty, which was signed in 1987 between the USSR and the USA.

According to Western data, the missile has been tested since 2008 (source). Apparently, in 2014, the State tests of the 9M729 missile and its improved version were completed (source). In 2016, it is planned to purchase 8 MZKT-7930 chassis for the assembly of 4 SPUs and 4 TZMs at the facilities of the Titan Central Design Bureau (Volgograd, source). Presumably, these SPU and TZM will be sent to the 630th Missile Division (Kapustin Yar proving ground) for testing and trial operation. Accordingly, there is an assumption that both the complex and the means of the complex are a modification of the Iskander-M missile system with expanded capabilities, the details of which are still unknown (March 2016).

The name of the missile "9M729" was originally taken from various foreign sources (for example, source). And it is confirmed in the congratulations on the 70th anniversary of the creation of the 4th GCMP of the Ministry of Defense of the Russian Federation (Kapustin Yar proving ground, March 2016) from the general designer of the OKB "Novator" Pavel Kamnev: "Your team makes a significant contribution to the development of missile systems of various classes. We have been convinced of this many times during the testing of such missiles as 9M82, 9M82MD, 9M83, 9M728, 9M729, 77N6-N, MN-300, 53T6" (source).



Comparison of cruise missiles of different types and generations of the Novator Design Bureau (05.12.2015, MilitaryRussia.Ru).

Author: DIMMI Created: 03.12.2015 00:25:25 Comments: 55 READ THE FULL ARTICLE

1 2 3 4 5 6 7 ... 14 15 16